

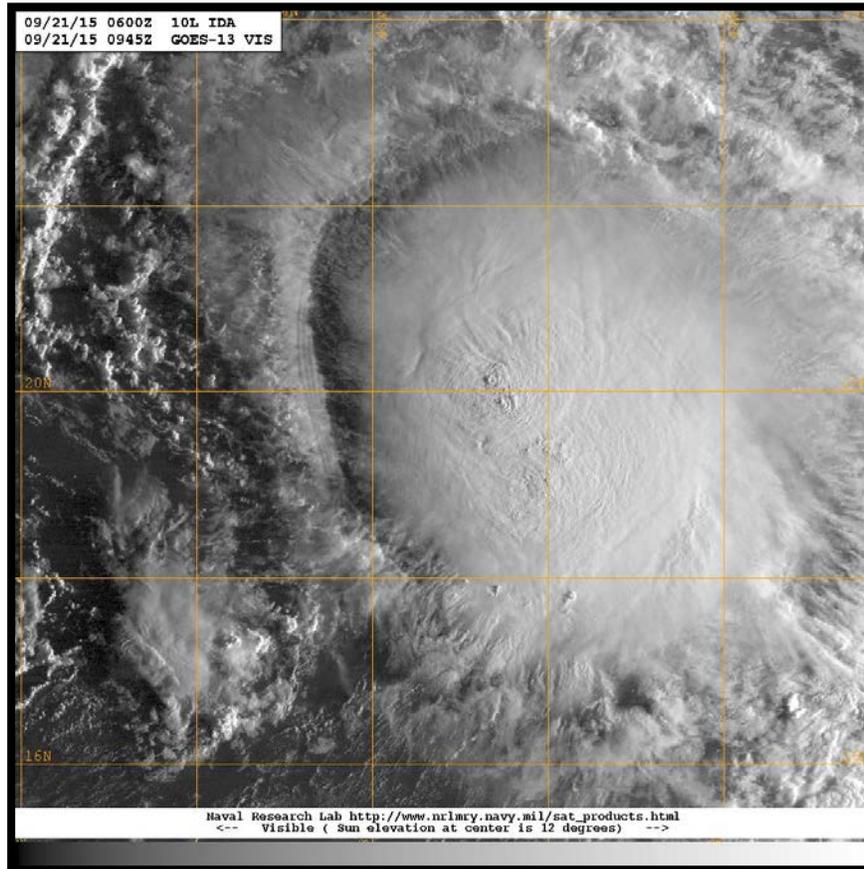


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM IDA (AL102015)

18 – 27 SEPTEMBER 2015

John P. Cangialosi
National Hurricane Center
7 November 2015



GOES-EAST VISIBLE SATELLITE IMAGE OF TROPICAL STORM IDA AT 0945 UTC 21 SEPTEMBER 2015.
IMAGE COURTESY OF THE U.S. NAVAL RESEARCH LAB.

Ida was a sheared tropical storm that meandered over the central Atlantic for several days.

Tropical Storm Ida

18 – 27 SEPTEMBER 2015

SYNOPTIC HISTORY

The origin of Ida was associated with a tropical wave and a convectively coupled Kelvin wave, the latter of which helped spawn Tropical Depression Nine over the central Atlantic a couple of days earlier. The tropical wave moved off of the west coast of Africa on 13 September, with a broad circulation and a vorticity maximum centered along the wave axis near 9° N. The wave moved westward at about 15 kt and produced a large area of showers and thunderstorms when it was over the far eastern Atlantic, and satellite images indicate that a well-defined low pressure area formed around 1200 UTC 15 September, about 350 n mi south of the southernmost Cape Verde Islands. Deep convection waxed and waned near the low center during the next few days before it developed a sufficient amount of organization to be considered a tropical depression, which occurred near 0600 UTC 18 September when it was located about 650 n mi west of the southernmost Cape Verde Islands. The “best track” chart of the tropical cyclone’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1¹.

The depression moved west-northwestward, steered by a subtropical ridge to its north, and strengthened to a tropical storm by 0000 UTC 19 September. Around that time, westerly shear associated with a mid- to upper-level trough over the subtropical Atlantic caused the low-level center of Ida to be exposed to the west of the deep convection, and the cyclone intensified very slowly. The shear relaxed a couple of days later, allowing Ida to reach its maximum wind speed of 45 kt by 0600 UTC 21 September, when it was located about 900 n mi east of the northern Leeward Islands.

The shear increased again later on 21 September, and Ida began to slowly weaken. After having moved generally west-northwestward to northwestward since genesis, Ida slowed down and moved east-southeastward to southeastward beginning early 22 September when it became embedded in the flow associated with an amplifying mid- to upper-level trough to the northeast of the system over the eastern Atlantic. The strong shear associated with the trough caused Ida to weaken to a tropical depression around 0600 UTC 24 September. On 25 September, the trough lifted out and was replaced by a building subtropical ridge, which resulted in Ida turning back to the northwest later that day and west-northwestward the following day. The strong shear remained, however, keeping Ida’s center to the west of a pulsing area of deep convection. The strong shear and dry air near the system finally caused most of the convection to dissipate around 1200 UTC 27 September, at which time the cyclone became a remnant low.

¹ A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year’s storms are located in the *bt* directory, while previous years’ data are located in the *archive* directory.

The circulation of the remnant low became elongated later on 27 September, due to its interaction with a cold front a few hundred n mi to the north of the cyclone, and Ida degenerated into a trough by 0600 UTC 28 September about 750 n mi east-northeast of the northern Leeward Islands. Ida's remnants moved generally westward and a couple of days later merged with the frontal system, which produced gale-force winds while it was nearly stationary over the central Atlantic on 2 and 3 October.

METEOROLOGICAL STATISTICS

Observations in Ida (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Global Precipitation Mission (GPM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Ida.

The estimated 45-kt peak intensity of Ida from 0600 to 1800 UTC 21 September is based on T3.0 (45 kt) Dvorak satellite intensity estimates from TAFB and a 1312 UTC ASCAT-B pass that day.

There were no ship reports or surface observations of winds of tropical storm force associated with Ida.

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Ida.

FORECAST AND WARNING CRITIQUE

The genesis of Ida was well predicted. The system that became Ida was introduced into the Tropical Weather Outlook (TWO) with a low (< 40 %) chance of formation during the next 5 days 108 h before genesis, and it was included in the 48-h TWO 84 h before formation. The probability reached the high category (> 60% chance of formation) 72 h before genesis in the 5-day TWO and 42 h before formation in the 48-h TWO. All of the genesis forecast lead times are given in Table 2.

A verification of NHC official track forecasts for Ida is given in Table 3a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period. A homogeneous

comparison of the official track errors with selected guidance models is given in Table 3b. The official track forecasts were slightly beat by EMXI and the consensus aids TVCA, GFEX, and TVCX at several forecast times. The majority of the models and the official forecasts had a westward bias for Ida, as they did not anticipate the extent of the influence of an upper-level trough from 23 to 25 September (Figure 4).

A verification of NHC official intensity forecasts for Ida is given in Table 4a. Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period from 12 to 72 h, but higher than the 5-yr mean at 96 and 120 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. The official forecasts had lower errors than all of the models in the short term, but HWFI, LGEM, and the global models GFSI and EMXI beat the official forecasts at the longer range forecast times. Most of the intensity models had a high bias for Ida. In particular, the GHMI model had a very large high bias with many of those runs calling for Ida to become a hurricane (Figure 5).

There were no coastal watches or warnings associated with Ida.



Table 1. Best track for Tropical Storm Ida, 18-27 September 2015.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
15 / 1200	9.4	24.2	1010	25	low
15 / 1800	9.7	25.5	1010	25	"
16 / 0000	10.0	26.6	1010	25	"
16 / 0600	10.4	27.5	1010	25	"
16 / 1200	10.7	28.4	1010	25	"
16 / 1800	11.0	29.4	1009	25	"
17 / 0000	11.3	30.6	1009	25	"
17 / 0600	11.6	31.8	1008	25	"
17 / 1200	12.0	32.9	1008	25	"
17 / 1800	12.3	34.0	1008	25	"
18 / 0000	12.6	34.9	1008	25	"
18 / 0600	12.9	35.7	1007	25	tropical depression
18 / 1200	13.1	36.5	1007	25	"
18 / 1800	13.4	37.0	1006	30	"
19 / 0000	13.6	37.4	1005	35	tropical storm
19 / 0600	14.0	38.1	1005	35	"
19 / 1200	14.5	39.1	1005	35	"
19 / 1800	15.1	40.4	1005	35	"
20 / 0000	15.7	41.7	1004	40	"
20 / 0600	16.2	43.1	1004	40	"
20 / 1200	16.9	44.4	1004	40	"
20 / 1800	17.8	45.6	1003	40	"
21 / 0000	18.8	46.5	1003	40	"
21 / 0600	19.7	47.3	1002	45	"
21 / 1200	20.5	48.1	1001	45	"
21 / 1800	21.0	48.8	1001	45	"
22 / 0000	21.3	48.9	1002	40	"
22 / 0600	21.3	48.4	1002	40	"
22 / 1200	21.3	47.9	1002	40	"
22 / 1800	21.1	47.4	1003	40	"



23 / 0000	20.9	47.1	1004	35	"
23 / 0600	20.6	47.2	1004	35	"
23 / 1200	20.2	47.2	1004	35	"
23 / 1800	19.9	46.9	1004	35	"
24 / 0000	19.7	46.4	1004	35	"
24 / 0600	19.6	45.6	1005	30	tropical depression
24 / 1200	20.0	45.2	1005	30	"
24 / 1800	20.6	45.0	1005	30	"
25 / 0000	21.0	45.0	1006	30	"
25 / 0600	21.4	45.0	1006	30	"
25 / 1200	21.8	45.1	1006	30	"
25 / 1800	22.2	45.2	1006	30	"
26 / 0000	22.6	45.5	1006	30	"
26 / 0600	23.1	45.8	1006	30	"
26 / 1200	23.7	46.2	1006	30	"
26 / 1800	24.0	46.7	1006	30	"
27 / 0000	24.3	47.2	1006	30	"
27 / 0600	24.5	47.7	1007	25	"
27 / 1200	24.6	48.1	1007	25	low
27 / 1800	24.5	48.7	1007	25	"
28 / 0000	24.1	49.3	1008	20	"
28 / 0600					dissipated
21 / 1200	20.5	48.1	1001	45	maximum wind and minimum pressure



Table 2. Number of hours in advance of formation associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the “Low” category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<40%)	84	108
Medium (40%-60%)	72	90
High (>60%)	42	72

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Ida. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	28.6	39.6	50.1	63.2	80.8	99.5	139.6
OCD5	46.1	94.9	155.3	218.5	334.2	438.2	598.1
Forecasts	34	32	30	28	24	20	16
OFCL (2010-14)	28.4	45.0	60.4	77.1	113.1	157.8	210.0
OCD5 (2010-14)	48.3	101.5	161.5	222.6	329.8	412.6	483.9



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Ida. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	28.9	39.8	49.5	62.4	77.2	98.7	142.0
OCD5	46.5	96.8	159.2	223.4	340.0	451.9	614.1
GFSI	34.2	50.3	63.4	79.4	104.6	142.1	240.6
GHMI	38.4	56.7	70.1	86.1	115.0	174.4	250.6
HWFI	40.3	59.2	79.2	95.1	131.0	167.8	222.1
EGRI	31.3	47.1	62.1	86.3	132.8	186.8	270.7
EMXI	27.8	40.5	45.3	54.5	65.2	96.1	138.0
CMCI	36.3	58.1	81.8	101.8	153.3	201.9	259.7
NVGI	33.4	45.3	53.3	72.7	131.3	174.7	246.0
GFNI	36.0	58.8	78.5	112.9	156.5	219.3	308.6
AEMI	32.0	45.4	58.8	74.6	116.8	155.3	226.6
TVCA	31.0	41.6	49.4	62.8	79.4	93.9	137.8
GFEX	28.8	39.8	47.4	58.6	69.5	97.4	148.6
TVCX	29.5	39.0	46.8	57.9	72.2	89.0	127.8
LBAR	43.5	79.8	130.9	188.3	286.5	337.2	332.8
BAMS	39.0	72.7	111.8	154.8	260.2	420.2	624.9
BAMM	35.2	61.1	89.9	113.6	165.9	205.5	283.7
BAMD	45.1	81.3	120.9	162.9	211.1	240.3	307.8
Forecasts	33	31	29	27	23	19	15

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Ida. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	3.1	4.5	6.2	7.9	12.9	18.5	21.9
OCD5	4.1	7.1	8.6	12.6	18.0	25.5	32.4
Forecasts	34	32	30	28	24	20	16
OFCL (2010-14)	6.2	9.4	11.5	13.3	14.6	14.6	15.8
OCD5 (2010-14)	7.3	10.8	13.3	15.3	17.7	17.8	17.6

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Ida. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	3.1	4.5	6.2	7.9	12.9	18.5	21.9
OCD5	4.3	7.1	8.6	12.6	18.0	25.5	32.4
GHMI	6.1	9.4	13.8	17.0	29.3	47.3	59.0
GFNI	6.9	9.1	11.9	15.5	16.9	19.9	18.1
HWFI	4.4	5.8	7.0	7.1	9.8	13.8	12.7
DSHP	4.2	5.7	7.2	8.4	11.7	16.5	22.2
LGEM	4.0	5.1	5.6	5.9	8.8	14.4	20.8
IVCN	3.9	5.8	7.3	8.2	14.5	22.5	28.3
EMXI	3.6	4.7	5.6	5.4	7.1	10.8	17.3
GFSI	5.2	7.3	8.6	8.5	11.7	14.6	14.7
Forecasts	34	32	30	28	24	20	16

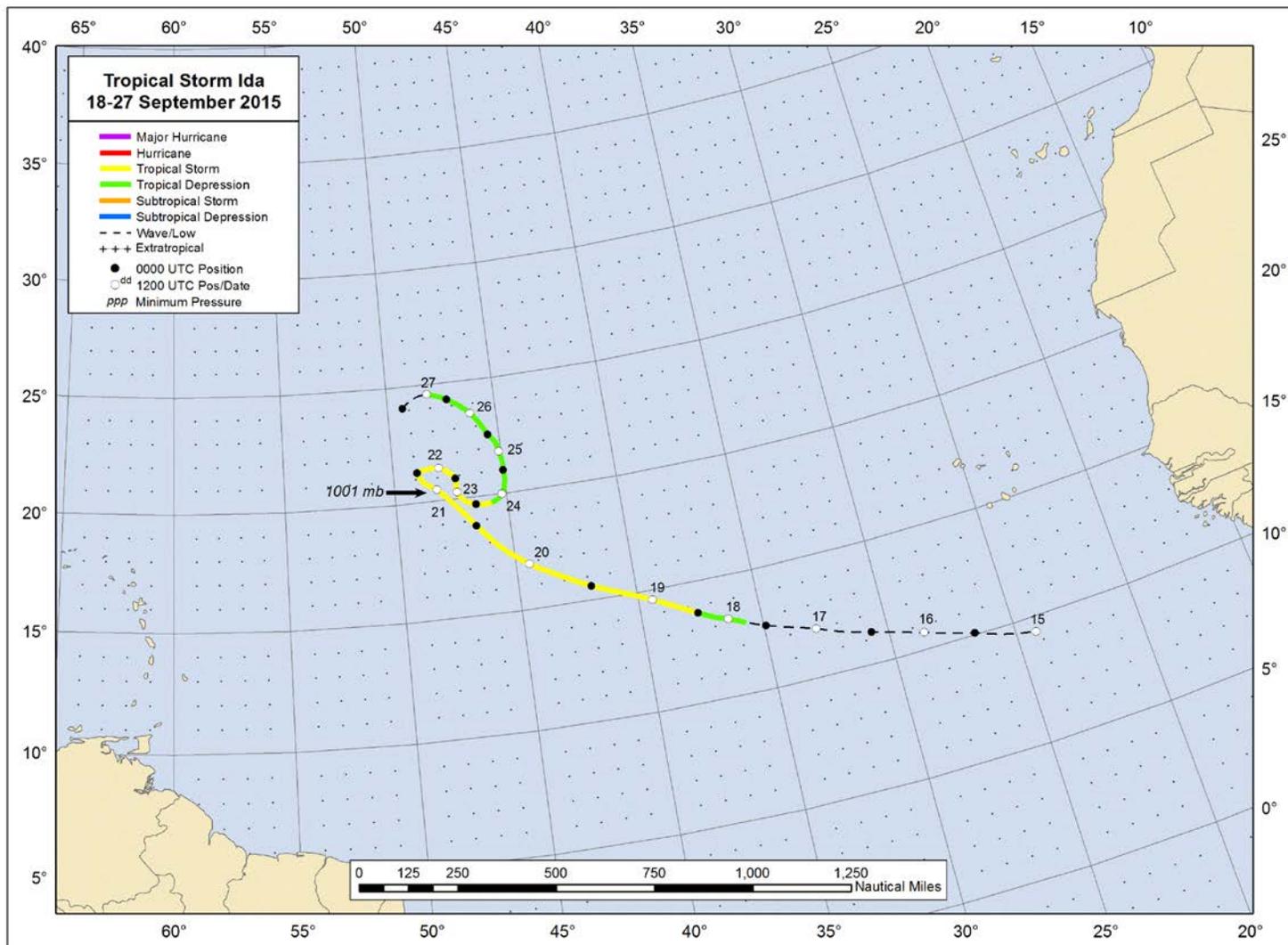


Figure 1. Best track positions for Tropical Storm Ida, 18-27 September 2015.

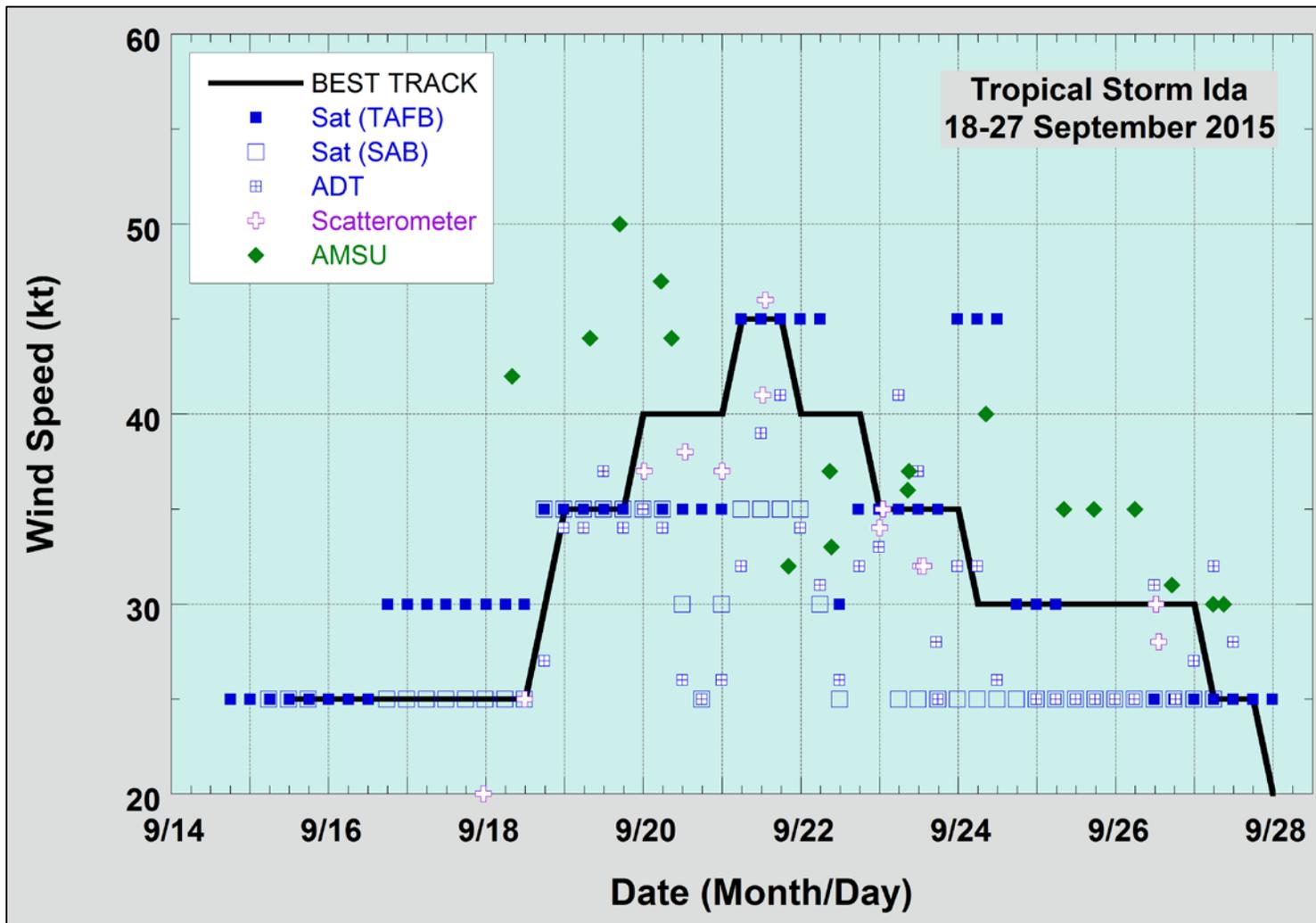


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Ida, 18-27 September 2015. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.

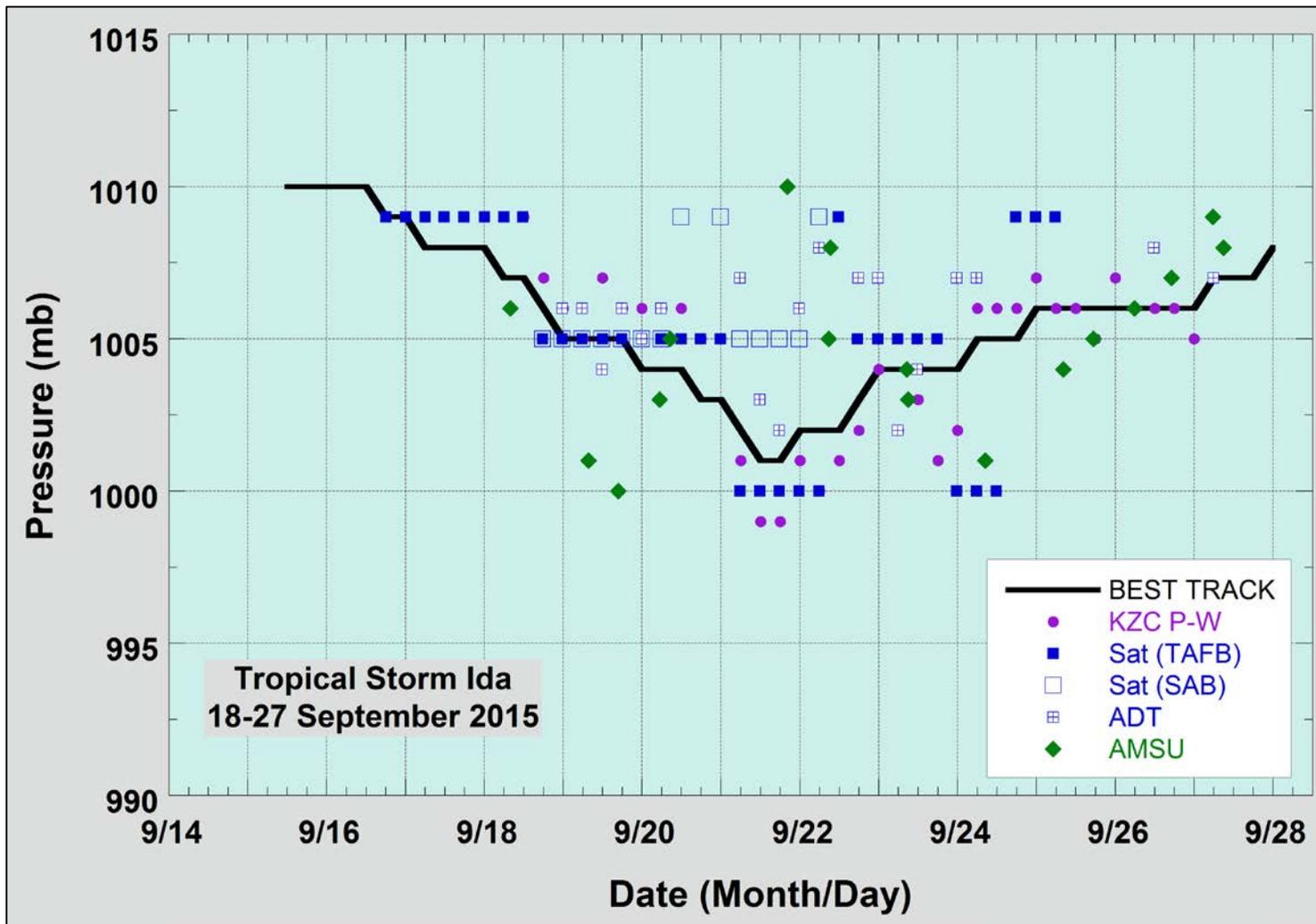


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Ida, 18-27 September 2015. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.

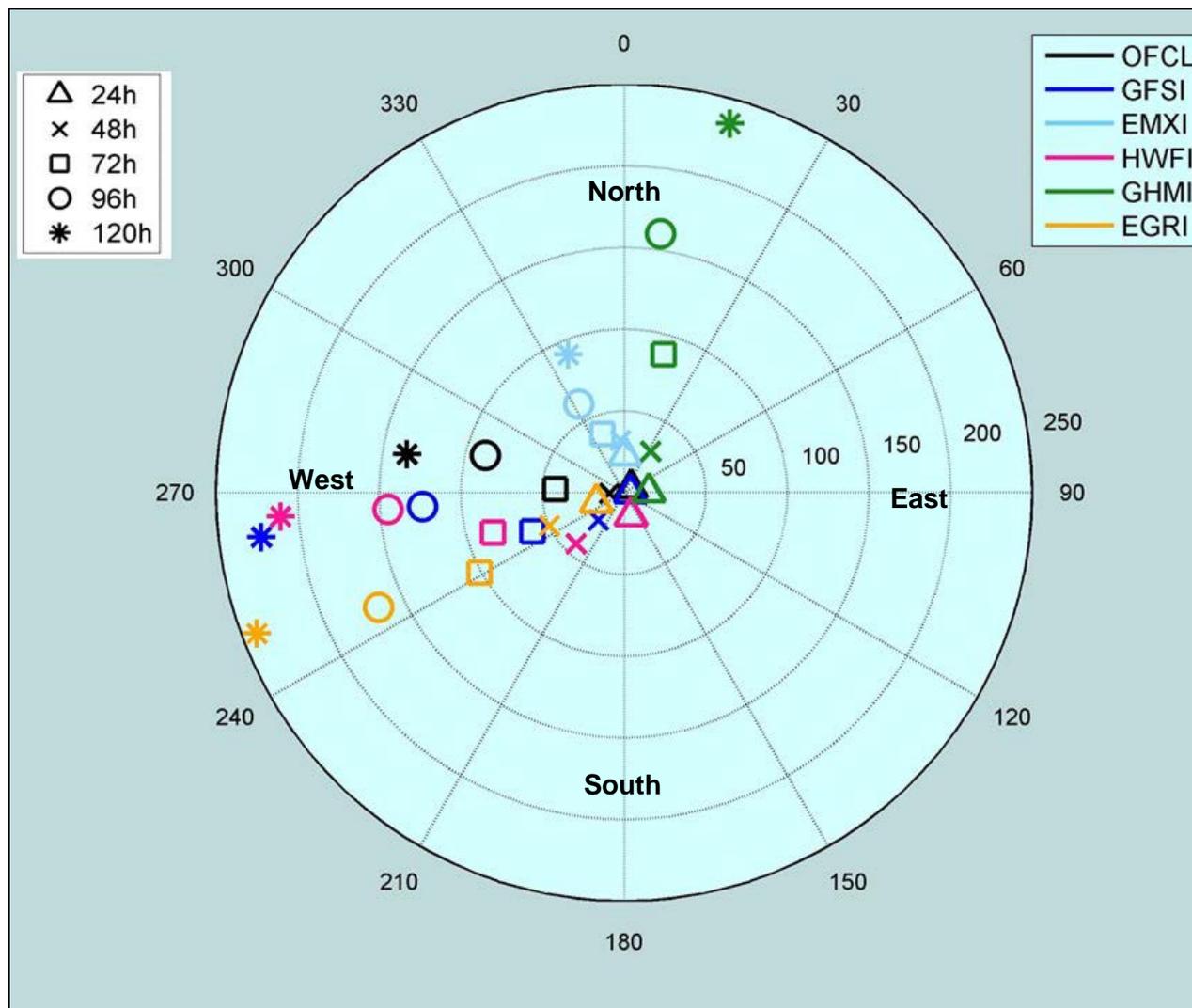


Figure 4. Polar plot of 24- to 120-h forecast track biases of selected models and the official forecast in n mi for Tropical Storm Ida.

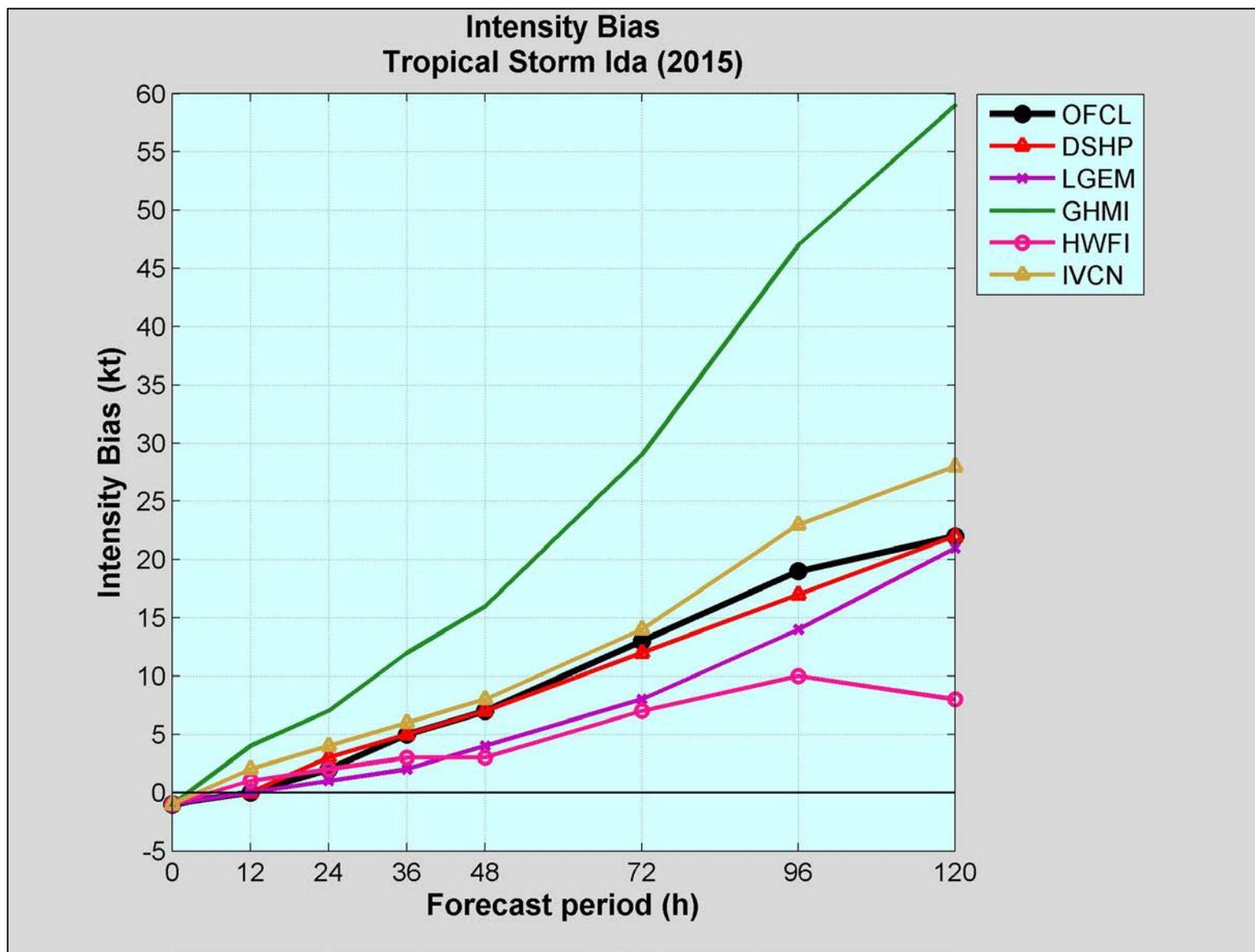


Figure 5. Intensity biases of selected models and the official forecast in kt for Tropical Storm Ida.